

In the Claims:

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Claims 1 to 15 (Canceled).

1 16. (New) Method for milling a freeform surface on a workpiece  
2 using a milling machine, whereby the workpiece is milled by  
3 a tool of the milling machine in such a manner so that a  
4 desired freeform surface is formed, and to carry out the  
5 milling the tool is moved relative to the workpiece along  
6 a tool path defined by splines, characterized in that the  
7 splines are calculated from support points stored in  
8 workpiece coordinates or in machine coordinates in a  
9 CAD/CAM system, and, independent of the freeform surface to  
10 be formed, the tool path is generated from six splines if  
11 the support points are defined in workpiece coordinates,  
12 and is generated from five splines if the support points  
13 are defined in machine coordinates, whereby one independent  
14 spline is produced for each coordinate.

1 17. (New) Method according to claim 16, characterized in that,  
2 for each tool path, the splines are calculated through the  
3 use of one or more interpolation parameters which are equal  
4 for all of the splines of the respective tool path, so that  
5 all of the splines of the respective tool path are  
6 synchronized with one another.

1 18. (New) Apparatus for milling a freeform surface on a  
2 workpiece, whereby a tool is adapted to mill the workpiece  
3 in such a manner so that a desired freeform surface is  
4 formed, comprising a programming arrangement (21) for  
5 programming a tool path, and comprising at least one  
6 control arrangement (28) for controlling a motion of the  
7 tool relative to the workpiece along the tool path defined  
8 by splines, characterized in that the programming  
9 arrangement (21) is embodied as a CAD/CAM system, and  
10 further comprising means (25) allocated to the programming  
11 arrangement (21) and adapted to calculate the splines from  
12 support points stored in workpiece coordinates or machine  
13 coordinates in the CAD/CAM system in such a manner so that  
14 the means (25), independent of the freeform surface to be  
15 formed, are adapted to generate the tool path from six  
16 splines if the support points are defined in workpiece  
17 coordinates, and from five splines if the support points  
18 are defined in machine coordinates, whereby an independent  
19 spline is produced for each coordinate, and wherein the  
20 CAD/CAM system is adapted to produce at least one APT file  
21 (22), and further comprising at least one  
22 downstream-connected post-processor (26) adapted to convert  
23 the at least one APT file into at least one control file  
24 (27) that is executable by the or each control arrangement  
25 (28), and whereby the or each control arrangement (28) is  
26 adapted to control the motion of the tool along the tool  
27 path in accordance with the splines.

1 19. (New) Apparatus according to claim 18, further comprising  
2 an APT processor (23), characterized in that the means (25)  
3 allocated to the programming arrangement (21) are arranged  
4 and adapted to transfer the splines to the APT processor  
5 (23) which is arranged and adapted to transfer the splines  
6 to the or each post-processor (26), whereby the or each  
7 post-processor (26) is arranged and adapted to provide the  
8 splines to the or each control arrangement (28) in a  
9 polynomial format.

1 20. (New) A method of milling a freeform surface on a workpiece  
2 using a miller tool, comprising the steps:  
3 a) defining tool path way points, each respectively in  
4 six workpiece coordinates or five machine coordinates,  
5 wherein said way points define points within tolerance  
6 limits along a contour of a nominal freeform surface  
7 that is to be milled;  
8 b) generating a plurality of splines dependent on and  
9 fitting said way points sufficiently closely to remain  
10 within said tolerance limits of said contour, wherein  
11 a respective independent one of said splines is  
12 respectively generated for each one of said workpiece  
13 coordinates or said machine coordinates of all of said  
14 way points, so that said plurality of splines includes  
15 a total of six splines respectively allocated to said  
16 six workpiece coordinates if said way points are  
17 defined in said six workpiece coordinates, and said  
18 plurality of splines includes a total of five splines

19 respectively allocated to said five machine  
20 coordinates if said way points are defined in said  
21 five machine coordinates; and  
22 c) moving said miller tool in contact with and relative  
23 to said workpiece so that said miller tool mills said  
24 workpiece, and controlling said moving of said miller  
25 tool in accordance with said plurality of splines  
26 respectively allocated to said workpiece coordinates  
27 or said machine coordinates so that said miller tool  
28 moves along a tool path defined by said splines in  
29 said workpiece coordinates or said machine coordinates  
30 and thereby mills an actual freeform surface on said  
31 workpiece within said tolerance limits of said contour  
32 of said nominal freeform surface.

1 21. (New) An apparatus for milling a freeform surface on a  
2 workpiece, comprising:

3 a movable miller tool that is movable relative to the  
4 workpiece;

5 plural control arrangements respectively adapted to  
6 control a motion of said miller tool respectively in six  
7 workpiece coordinates or in five machine coordinates;

8 a programming arrangement programed to define tool  
9 path way points in said six workpiece coordinates or in  
10 said five machine coordinates, wherein said way points  
11 define points within tolerance limits along a contour of a  
12 nominal freeform surface that is to be milled;

13           a processing arrangement that is interposed between  
14           said programming arrangement and said control arrangements,  
15           and that is adapted and programmed to generate a plurality  
16           of splines dependent on and fitting said way points  
17           sufficiently closely to remain within said tolerance limits  
18           of said contour, wherein a respective independent one of  
19           said splines is respectively to be generated for each one  
20           of said workpiece coordinates or said machine coordinates  
21           of all of said way points, so that said plurality of  
22           splines includes a total of six splines respectively  
23           allocated to said six workpiece coordinates if said way  
24           points are defined in said six workpiece coordinates, and  
25           said plurality of splines includes a total of five splines  
26           respectively allocated to said five machine coordinates if  
27           said way points are defined in said five machine  
28           coordinates; and

29           wherein said control arrangements are adapted to  
30           control the motion of said miller tool in accordance with  
31           said plurality of splines respectively allocated to said  
32           workpiece coordinates or said machine coordinates so that  
33           said miller tool is adapted to move along a tool path  
34           defined by said splines in said workpiece coordinates or  
35           said machine coordinates and thereby to mill an actual  
36           freeform surface on said workpiece within said tolerance  
37           limits of said contour of said nominal freeform surface.